

REMARKS

Claims 1-16 are pending in the application. Claims 1, 7, 9, 11, 12, and 13 are currently amended based on support in the application as filed, including the specification, page 3, lines 8-11. Claim 10 is canceled. Claims 1-9 and 11-16 would be all of the claims remaining in the application if the current amendments are entered.

Applicants following remarks are respectfully submitted. The undersigned would be delighted to receive a telephone call from Examiner Zhao to discuss any matters that might remain outstanding after consideration of this response. Applicants and the undersigned thank Examiner Zhao for his diligence.

Currently Claimed Invention

The current amendments to claims 1, 7 and 9 add a concentration of the basic or neutral surfactant, or the combination thereof, wherein the concentration is sufficient to increase stability of the protected alkylborane complex or trialkylborane-organonitrogen complex, respectively, in water (specification page 3, lines 8-11). The current amendment to claim 9 further adds the subject matter from dependent claim 10, which is now canceled.

The current amendments to claims 11 and 12 change dependency from claim 10 to claim 9 in view of the above amendment to claim 9 and cancellation of claim 10.

The current amendments to claim 13 add a concentration of the basic or neutral surfactant, or the combination thereof, wherein the concentration is sufficient to increase stability of the trialkylborane-organonitrogen complex in water (specification page 3, lines 8-11). The current amendments to claim 13 also add a limitation that the curing adhesive can be applied to the low surface energy substrate to make an effective adhesive (specification page 6, lines 4-5 and Abstract).

Applicants believe the current amendments patentably distinguish the claimed invention over the prior art cited in the Office Action. As currently amended the claims

encompass a concentration range of the neutral or basic surfactant sufficient to increase stability of the protected alkylborane complex in water. This increase in stability in water in the concentration range of the neutral or basic surfactant is not a predictable result in view of the prior art.

For convenience, the trialkylborane-organonitrogen complex and protected alkylborane complex are collectively referred to herein as the Instant Complex.

Claim Rejections – 35 U.S.C. § 103

In Item 4 of the Office Action, claims 1-15 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable (obvious) over Sonnenschein et al., US 2002/0033227 in view of Lassila et al., US 2005/0176605 A1. It was argued that it would have been obvious to add the certain surfactant of paragraph [0071] of Lassila et al. to the adhesive formulation of Sonnenschein et al. (US '227) to arrive at the 2-part adhesive composition of claims 1-12. Also, it was argued that it would have been obvious to contact components of such the 2-part adhesive composition and applying the adhesive to substrates as in paragraph [0013] of Sonnenschein et al. (US '227), including a low surface energy substrate in paragraph [0014].

Applicants disagree. It is when the neutral or basic surfactant or combination thereof is used in the instant concentration that the Instant Complex becomes unexpectedly stable in water. The stability of the Instant Complex in water is evidenced by instant Examples 1-9, 11, and 12. (Example 10 is omitted since there H29B is stabilized by a Poly(acrylic acid) that was neutralized beforehand by NaOH, but mention of the NaOH neutralization was inadvertently omitted from Example 10.)

In Examples 1-9, water borne adhesives are prepared from the claimed 2-part adhesive formulation and applied to a surface of a substrate. The 2-part adhesive formulations of Examples 1-9 have the claimed first and second parts wherein the first part comprises water, a surfactant which is a neutral or a basic surfactant or a combination thereof, and the Instant Complex. In Examples 1-9 the Instant Complex is the H29A. (H29A is described in the specification on page 6, lines 6-8.) The neutral or

basic surfactant in Examples 1-9 is a polyvinylpyrrolidinone; polyvinyl alcohol; polyethylene glycol; Jeffamine™ 2000, polyetheramine; fully neutralized sodium salt of polyacrylic acid ($M_w = 30,000$); polyacrylamide ($M_w = 10,000$); Polyox™ N 80 polyethylene glycol; or Teflon™ PFA fluoropolymer. Examples 1-9 also contain poly(methyl methacrylate) as a thixotropic agent.

In Examples 11 and 12, water borne coatings are prepared and applied to a surface of a substrate. In Examples 11 and 12 the Instant Complex is the H29B. (H29B is described in the specification on page 6, lines 9-11.) The neutral or basic surfactant in Examples 11 and 12 is a Poly(propylene glycol)-block-poly(ethylene glycol)-block-poly(propylene glycol)bis(2-aminopropyl ether) or Polyacrylamide. Examples 11 and 12 also contain poly(methyl methacrylate-co-ethyl acrylate) as a thixotropic agent.

As described in Examples 1-9, 11, and 12, the water borne adhesives and coatings do not exhibit adhesion failure, which demonstrates that the neutral or basic surfactant stabilizes the Instant Complex in water. If the neutral or basic surfactant had not stabilized the Instant Complex in water in the first part of the 2-part adhesive formulation used in Examples 1-9 or in the coating used in Examples 11 and 12, then the adhesives of Examples 1-9 and coatings of Examples 11 and 12 would have exhibited adhesion failure. This adhesion failure would have occurred because the Instant Complex would have decomposed in water in absence of the neutral or basic surfactant. Evidence for this decomposition was already made of record in the form of an Analytical Report that was submitted in the parent PCT International Application Number PCT/US2005/004097 as an exhibit with Applicants' response to the PCT Written Opinion (the instant application is a §371 application from PCT/US2005/004097). (Also, Applicants previously enclosed a copy of their response to the PCT Written Opinion and a copy of the Analytical Report with their December 22, 2009, reply to a prior non-final Office Action in the instant application.) The Analytical Report indicates that upon combination of water and the Instant Complex without the instant neutral or basic surfactant, a reaction occurred resulting in substantial loss of the Instant Complex. Note in the Analytical Report the difference in ratio area counts of the Instant Complex when in solvent acetonitrile, which did not contain significant amount of water, versus when in water or when in a

water/acetonitrile blend. But as noted previously for in Examples 1-9, 11 and 12, adhesion failure did not occur with the instant neutral or basic surfactant. Accordingly, the neutral or basic surfactant stabilizes the Instant Complex in water in the instant neutral or basic surfactant-stabilized 2-part adhesive formulation of claims 1 and 7 and composition of claim 9 and during the claimed invention method of claim 13.

Applicants note that there are fatal deficiencies in the Lassila et al. reference. At the time the instant application was filed, a person of ordinary skill in the art (Skilled Artisan) might have been motivated to combine a certain surfactant from paragraph [0071] of Lassila et al. with the adhesive formulation containing a complex of Sonnenschein et al. (US'227) and, further, also motivated to elect to use water as the optional carrier additive of Sonnenschein et al. But paragraph [0069] of Lassila et al. limits concentration of the surfactant (i.e., "dispersant") to from about 10 ppm to a maximum of about 10,000 ppm, and preferably a maximum of about 5,000 ppm, and more preferably a maximum of about 1,000 ppm. (Lassila et al. do not define what they mean by "part" in ppm.) With a surfactant concentration range limited to about 10 ppm to 10,000 ppm in Lassila et al. and a teaching toward using a lower concentration, Applicants believe that the Skilled Artisan would not have arrived at the instant concentration range of from 0.5 weight percent to 25 weight percent of the neutral or basic surfactant that enable the instant stabilizing effect. Another fatal deficiency of Lassila et al. is that, at best, the Skilled Artisan would only have expected that a neutral or basic surfactant, or combination thereof, could reduce surface tension of the water to enhance substrate wetting as taught in paragraph [0003] of Lassila et al. The Skilled Artisan would not have reasonably conceived of or expected increased stability of the complex in water. Thus, in view of the fatal deficiencies of Lassila et al. the Skilled Artisan having Sonnenschein et al. (US'227) and Lassila et al. would not have reasonably conceived of the instant concentration range of from 0.5 weight percent to 25 weight percent of the neutral or basic surfactant or expected the instant stabilizing effect on the Instant Complex in water.

The neutral or basic surfactant is present in the first part of the instant composition/coating or 2-part adhesive formulation in a concentration sufficient to

increase the stability of the Instant Complex in water. The increase in stability in the first part of the instant composition or 2-part adhesive formulation is demonstrated by Examples 1-9. The increase in stability in the composition/coating is demonstrated by Examples 11 and 12. In view of the above remarks, this increase in stability of the Instant Complex in water as a result of the neutral or basic surfactant in the instant concentration range is not a predictable result from Sonnenschein et al. (US '227) in view of Lassila et al. Accordingly, the subject matter of claims 1, 7, 9, and 13 is not obvious and is patentable over Sonnenschein et al. (US'227) in view of Lassila et al. under 35 U.S.C. § 103(a).

Dependent claims 2-8 and claims 11 and 12 further limit, directly or indirectly, claim 1 and 9, respectively, without negatively affecting the instant stabilizing effect. In claims 2-8 and claims 9, 11, and 12, the second part of the 2-part adhesive formulation and the composition, respectively, further comprises an acrylic polymer as a thixotropic agent. As demonstrated by Examples 1-9, 11 and 12, the stabilizing function of the neutral or basic surfactant in the first part of the 2-part adhesive formulation of claim 1 or 7 or composition of claim 9 is maintained with the acrylic polymer as the thixotropic agent. Since the subject matter of claims 1, 7, and 9 is patentable for the reasons give previously, the subject matter of dependent claims 2-6, claim 8, and claims 10-12, respectively, also is not obvious and is patentable over Sonnenschein et al. (US'227) in view of Lassila et al. under 35 U.S.C. § 103(a).

Claim 10 is canceled, rendering rejection of claim 10 moot.

The method of claim 14 or 15 further describes timing of the steps or composition of the low surface energy substrate. Since the method of claim 13 is patentable for the reasons give previously, the method of dependent claims 14 and 15 is not obvious and is patentable over Sonnenschein et al. (US'227) in view of Lassila et al. under 35 U.S.C. § 103(a).

In item 5 of the Office Action, claim 16 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable (obvious) over Sonnenschein et al., US 2002/0033227 in view of Lassila et al., US 2005/0176605 A1 and further in view of Sonnenschein et al., US 2004/0259990 A1. Applicants disagree. Since the method of claim 13 could not have been predicted from Sonnenschein et al. (US'227) in view of Lassila et al. for the reasons give previously, and Sonnenschein et al. (US'990) merely supplies isotactic polypropylene as an example of a low surface energy substrate, the method of dependent claim 16 also could not have been predicted from Sonnenschein et al. (US'227) in view of Lassila et al. and further in view of Sonnenschein et al. (US'990) Accordingly, Applicants believe that the invention method of claim 16 is not obvious and is patentable over Sonnenschein et al. in view of Lassila et al. and further in view of Sonnenschein et al. (US'990) under 35 U.S.C. § 103(a).

Conclusion

In view of the above amendments and remarks, Applicants believe that the rejections are overcome and the invention of claims 1-9 and 11-16, is patentable and the application in condition for allowance. Applicants request reconsideration and allowance of claims 1-9 and 11-16.

The undersigned can be reached by telephone or facsimile at the numbers provided below.

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Respectfully submitted,

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